

5. Laser Safety

The scanCONTROL 2800/2810 sensors operate with a semiconductor laser having a wavelength of 658 nm (visible/red). The laser operation is indicated visually by the LED on the sensor and on the controller.

Laser Class 2M

scanCONTROL 2800/2810 sensors with a maximum laser power up to 15 mW are classified in Laser Class 2M (IIM). The following information labels are fitted to the sensor housing (front and rear side). If both information labels are hidden in the installed state, the user must ensure that additional labels are fitted at the point of installation.



Laser radiation
Do not stare into the beam or view directly with optical instruments
Class 2M Laser Product
IEC 60825-1:2008-05
 $P \leq 15 \text{ mW}$; $E \leq 7.5 \text{ mW/cm}^2$; $\lambda = 658 \text{ nm}$

THIS PRODUCT COMPLIES WITH FDA REGULATIONS
21CFR 1040.10 AND 1040.11

CAUTION

Hazard to the eye via laser radiation! Consciously close your eyes or turn away if the laser radiation impinges on the eye.

Lasers of Class 2M are not subject to notification and a laser protection officer is not required. Mark the laser area recognizable and everlasting.

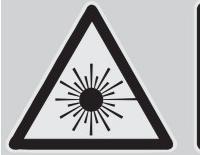
Laser Class 3B

scanCONTROL 2800/2810 sensors with a maximum laser power up to 50 mW are classified in Laser Class 3B (IIIB).

CAUTION

Injury to the eye or the skin via laser radiation! Consciously close your eyes or turn away if the laser radiation impinges on the eye or the skin.

Class 3B (IIIB) laser sensors are notifiable and a laser protection officer is required either. During operation the laser area has to be restricted and marked. The following information label should be fitted to the sensor housing (front and rear side):



Laser radiation
Avoid exposure to the beam
Class 3B Laser Product
IEC 60825-1:2008-05
 $P \leq 50 \text{ mW}$; $\lambda = 658 \text{ nm}$

THIS PRODUCT COMPLIES WITH FDA REGULATIONS
21CFR 1040.10 AND 1040.11

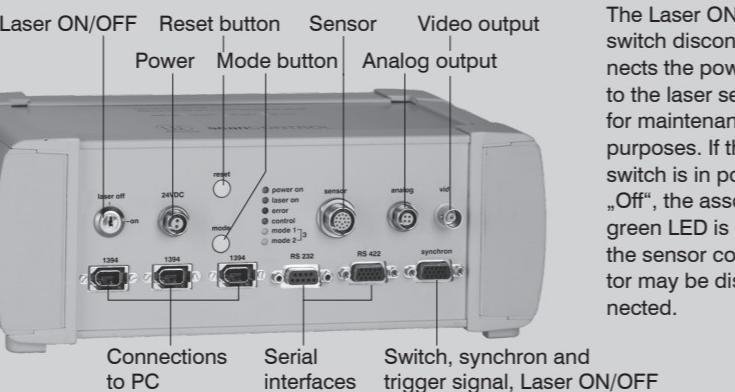
Beam attenuator

The beam attenuator prevents access to all laser and collateral radiation. The figures show the sensor with closed and open beam attenuator. The beam attenuator must be open during measurement.

Sensors need an external key switch to switch off the laser to be classified in Laser Class 3B (IIIB).



6. Connections, LED Displays



The Laser ON/OFF switch disconnects the power to the laser sensor for maintenance purposes. If the switch is in position „Off“, the associated green LED is off and the sensor connector may be disconnected.

LED Displays

„Power on“	<input type="radio"/>	No power supply		Power supply is on
„Laser on“	<input type="radio"/>	Laser is off		Laser is on
„Error“		Errors are encoded by different flashing sequences, see Chap. 13.3 instruction manual		
„Control“	<input type="radio"/>	No communication with PC		flashes long during data transmission flashes short during control access

	Operation mode			
	Default	Mode 1	Mode 2	Mode 3
„Mode 1“	<input type="radio"/>		<input type="radio"/>	
„Mode 2“	<input type="radio"/>	<input type="radio"/>		

A green LED on the sensor signals “laser on”.

Power supply

Pin	Assignment	PC2800-x (old in ())	
1	+24 VDC	white (red)	
2	GND	brown (black or blue)	
Housing	Screen	black	

View: Solder-pin side, male cable connector

The minus pole of the supply voltage (Power GND) is electrically isolated from the system ground.

i The sensor may only be plugged/unplugged with power switched off, i.e. with the operating voltage switched off or with the keyswitch in the “Off” position (Laser off).

Switch-, Synchron- and Trigger Signal, Laser ON/OFF

Pin	Assignment	Function, Remark
1	Sync. In +	Optocoupler
7	Sync. In -	
11	Sync. Out	
6	GND Sync. Out	System ground
13	Laser On/Off +	Optocoupler
3	Laser On/Off -	
8	Input +	Mode, optocoupler
2	Input -	
15	Output +	Mode 1, opto decoupled
5	Output -	
10	Output +	Mode 2, opto decoupled
4	Output -	
14	Output +	Error, opto decoupled
9	Output -	
12	---	n.c.

15-pole HD subminiature connector, solder pin side male cable connector

The connections 2, 3, 4, 5 and 9 are electrically connected to the minus pole (Power-GND) of the 24 V DC supply voltage.

Open collector outputs, short circuit and reverse-polarity protected up to 30 VDC,

The resistance in the conducting state is 15 Ohm or less at $I_L = 100 \text{ mA}$.

External circuit with load (e.g. relay) between external auxiliary power (e.g. power supply + 24 V DC) and the output+. Connect the negative pole of the auxiliary power with the negative pole of the power supply (does not apply with use of the power supply).

Using the scanCONTROL 2810 sensor the pin assignment changes as follows:

15	Output +	Digital output 1, opto decoupled
5	Output -	
10	Output +	Digital output 2, opto decoupled
4	Output -	
14	Output +	Digital output 3, opto decoupled
9	Output -	

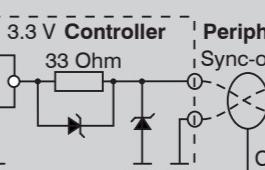
Open collector outputs, short circuit and reverse-polarity protected up to 30 VDC,

The resistance in the conducting state is 15 Ohm or less at $I_L = 100 \text{ mA}$.

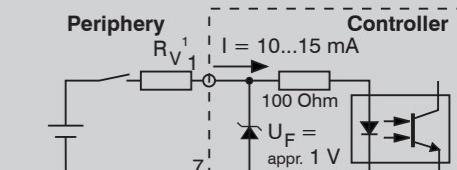
Output Circuit of the Error and Mode Outputs

States on the error output: T is closed, if an error occurs.

Synchronization and Triggering



Synchronization output circuit



Synchronization input circuit

The optocoupler at the sync input needs a current of 10 to 15 mA for operation. Do not exceed this current value with external trigger sources.

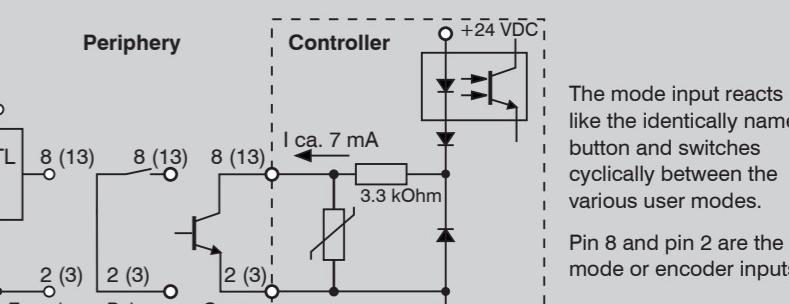
1) Resistor R_V is used in combination with a trigger input only, see Chap. 6.5 instruction manual.

Laser ON/OFF, Mode and Encoder Inputs

The two available digital inputs with the same input circuit are configured in the standard version as “laser on/off” and “mode” inputs. They can be directly controlled by open collector transistor inputs or relay contacts. The power supply + 24 V DC is internally connected as an auxiliary power supply.

i **Laser Class 2M/IIM (15 mW):** Laser is on, without connection between the pins 13 and 3 also.

Laser Class 3B/IIIB (50 mW): Laser is on, if Pin 13 and 3 are connected.



Input circuit of the laser ON/OFF and mode inputs.

The mode input reacts like the identically named button and switches cyclically between the various user modes.

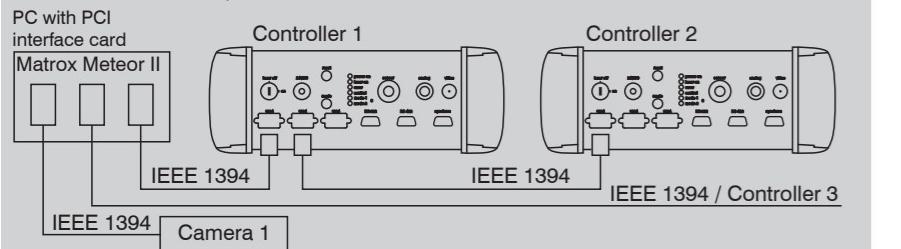
Pin 8 and pin 2 are the mode or encoder inputs.

FireWire Connection (1394), Standard connection to PC

FireWire (or the IEEE 1394 bus) is a serial bus system which can be branched as required with up to 63 devices operating together on one PC interface. The data are transmitted in both directions (bi-directional) on symmetrical and shielded two wire lines via standard cable.

Restrictions:

- The branching must not include loops.
- A maximum of 17 devices can be cascaded in a line ("daisy-chained").
- The maximum cable length between two devices is 4.5 m.
- The maximum length of a "daisy chain" section is 72 m.
- The data rate of 400 Mbit/s applies to the whole bus and must be shared between the connected devices. In the standard configuration up to four scanCONTROL 2800/2810 controllers can be operated on one bus.



Example of a FireWire configuration

6-pole connector		Connector type „1394“
Pin	Signal	The PIN numbers refer to the scanCONTROL 2800/2810.
1	NC	Micro-Epsilon recommends to use the SCD-IEEE-1394-3 FireWire cable from the optional accessories.
2	NC	
3	TPB-	Three fully equivalent 6-pole connection sockets are provided with connection assignment according to the 1394-1995 specification. The controller does not supply any operating voltage to the 1394 connection sockets. The IEEE 1394 (FireWire) interfaces are electrically isolated from the rest of the circuit.
4	TPB+	
5	TPA-	
6	TPA+	

View on solder pin side

7. System Requirements scanCONTROL Software

- Windows XP SP 2 (32) / Windows Vista (32) / Windows 7 (32/64)
- Pentium III 800 MHz / 512 MB RAM
- Screen resolution: 1024 x 768

8. Quick Start: Commissioning, Software

- Install the software.



Please insert the scanCONTROL Demo CD in the CD-ROM device. Follow the dialog through the installation process.

- A. Reading of installation help
- B. Installation of software
- C. Further informations in the online documentation

i The sensor may only be connected to the controller with power switched off or with the keyswitch in the "Off" position (Laser off).

- Mount the sensor according to the installation instructions.
- Connect the sensor to the controller. Connect the controller to the PC using a FireWire cable.
- Connect the controller to display or monitoring units.
- Connect the controller to the power supply.
- Connect the shield of the power supply cable to the PE protective earth conductor of the main power supply. Close plug-in connections not needed with the supplied protective caps for ODU sockets. Switch on the 24 VDC power supply.

i Sensor and controller need a warm-up time of typically 20 minutes for high precision measurements.

- Install the drivers for the measuring system according to the instructions on the supplied CD-ROM ([CD]:\Documentation\english\Installation\index.html).

9. Driver Installation for Windows XP

- Finish the installation of the Configuration Tools software completely. This procedure is described in section 8. Connect the controller to the PC using the 1394 FireWire cable. Switch on the power supply.

If the installation doesn't start automatically, search for scanCONTROL in the device manager (Start > Control Panel > System > Device Manager). scanCONTROL is classified as camera device and is either located under "Imaging Devices" or "Other Devices". Right-click the camera device and choose "Update Driver".

The "Hardware Update Wizard" will appear.

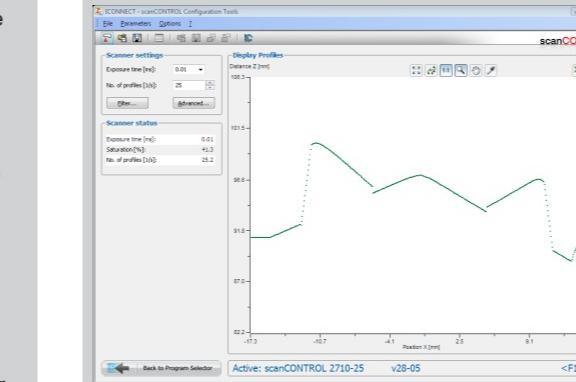
- Mark "No, not this time" and click on "Next".
- Click on "Next" to confirm this dialog.
- Now the operating system installs the driver for scanCONTROL. The "Hardware installation" dialog will appear.
- Click on "Continue anyway" to confirm this dialog.
- Click on "Finish" to end the driver installation.

If you want to install the driver at a later date or in case of an incorrect installation of the driver, you have to install the driver manually.

10. First Profile

- Now start the scanCONTROL Configuration Tools software. Click on "Display Profiles" in the main window.
- If the software shows the error message "No scanCONTROL found" in the status line, please check the installed driver in the device manager (Start > Control Panel > System > Device Manager).

On the left side you can adjust the settings for your measurement task, the right side shows the profile data and information about the measurement.



11. How to Access Profile Data

Profile data of scanCONTROL can be accessed via:

- DCAM standard v.1.30 for digital cameras via IEEE 1394 FireWire interface
- SDK for fast application integration (C, C++ and others)

For details refer to the enclosed online manuals.

12. Further Information

Please refer to

- the enclosed online manual
- the section „Status and Error Messages“ and „Notes“ in the scanCONTROL Configuration Tools manual.

You will find details to the separate programs in the respective instruction manuals or in the instruction manual of this sensor, Chap. 6.2. You will find the instruction manuals online or on the provided CD.

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X9771109-A051105HDR



Assembly Instructions scanCONTROL 2800/2810

1. Warnings

Connect the power supply and the display-/output device in accordance with the safety regulations for electrical equipment. The power supply may not exceed the specified limits.

> Danger of injury, damage or destruction of the sensor/controller

Avoid shock and vibration to the sensor/controller. Avoid continuous exposure to dust and spray on the sensor/controller. Avoid exposure to aggressive materials (washing agent, penetrating liquids or similar) on the sensor.

> Damage to or destruction of the sensor/controller

Read the detailed instruction manual before operation of the sensor. You will find this online or on the provided CD.

2. Notes on CE Identification

- The following applies to the scanCONTROL 2800/2810: EU directive 2004/108/EC and EU directive 2011/65/EC

- The sensor fulfills the specifications according to the following standards:

- DIN EN 55011/ 11.2007 / Industrial scientific and medical (ISM) equipment / Electromagnetic disturbance characteristics
- DIN EN 61 000-6-2/ 03.2006 / Electromagnetic Compatibility (EMC) / Immunity to interference / industrial area
- DIN EN 61326/ 10.2006 / Electrical equipment

The sensor fulfills the specifications of the EMC requirements, if the instructions in the manual are followed.

3. Proper Environment

- Protection class: IP 65 (with connected sensor cable)

- Operating temperature: 0 to +50 °C (+32 to +122 °F), by free circulation of air

- Storage temperature: -20 to +70 °C (-4 to +158 °F)

- Humidity: 5 - 95 % (non condensing)

- Vibration: DIN EN 60068-2-6 (sine shaped)

- Mechanical shock: DIN EN 60068-2-29

4. Standard Equipment scanCONTROL 2800/2810

- 1 Sensor LLT2800/2810 and controller
- 1 Power supply cable PC2800-3; round connector and free cable ends
- 1 Analog output plug, 4-pole, (ODU, Series MiniSnap L, Order no. S11L0C - T04MJGO - 7200)
- 1 scanCONTROL Demo-CD with drivers, programs and documentation
- 1 Sensor inspection log / Assembly instructions
- 1 FireWire connecting cable, 3 m long.